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DEVICE FOR PUTTING ON AND TAKING OFF A SUPPORT STOCKING

The present invention relates to a device for putting on or taking off elastic support socks or stockings, either by the user himself or with the aid of a third party.

Venous compression, a unanimously recognized technique for preventing and curing venous disorder, is effective only by virtue of the controlled high pressure exerted by the elastic fibers of the orthosis on the limb.

However, this high tension makes it exceedingly difficult to put on the support devices (especially by people with reduced mobility who are unable to overcome the resistance of the textile with their hands in order to "pass the heel" and who have difficulty bending forward).

Current devices consist either in using a "substocking" made of a silk textile, which makes it easier to slip the leg into the support stocking, or in holding the support stocking at its top in order to slip the leg therein. None of these devices solves the technical problems linked with the considerable resistance of the elastic textile and with the mobility difficulties of the users.

The invention described hereinafter therefore describes a technical solution, on the one hand to sufficiently distending the sock (or compressive stocking) to allow easy fitting and the "passing of the heel", and, on the other hand, by virtue of the addition of elongate handles, to putting on the sock by the user alone, who will be able to place the apparatus, and therefore the sock, at the end of his foot without effort.

Furthermore, this apparatus may be used by a third party (for example a nurse applying a sock to a patient) by removing the detachable handles.

- 5 Finally, the detachable part of the apparatus, by virtue of its elongate handles, will allow the user to remove his support devices by himself.

10 The description of the apparatus given below makes it necessary to state details regarding dimensions, which may be subject to modifications depending on the size of apparatus (large adult, normal adult or child) and on technical improvements. The dimensions are given by way of example.

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The apparatus, manufactured in metal or plastic, is composed of a flat plate (1) 28 cm long by 4.5 cm wide, securing two rods (10 and 11) of 20 mm diameter which are welded at its ends and which act as a slide guide, and supporting a rectangular tongue (2) 9 cm wide by 10 cm long in the form of an upwardly convex, flattened semicylinder perpendicular to said plate, constituting the upper part of the system for opening the sock (or the support stocking). Underneath, a flat plate (3) 25 having a height of 8.5 cm, fastened to two tubes which slide on the slide guides (10 and 11), supports a tongue (4) 9 cm wide by 10 cm long in the form of a downwardly very concave, small-radius cylinder portion, constituting the lower part of the sock-opening system.

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The sock (or stocking) is introduced by being slid over the ovoid tube formed by the two tongues (2 and 4). By means of a lever (5) fastened to the top plate (1) and by way of 15-cm-long connecting rods (6 and 7) fastened 35 onto the lever (5) at a distance of 5.5 cm from its hinge pins, the user will exert a relatively small downward force after taking hold by his other hand of

the handle (12) provided at the top of the apparatus and made in the fixed plate (1). The action of the lever will make it possible to separate the two plates (1 and 3) by moving away the sliding plate (3) and therefore to separate the two tongues (2 and 4) in order to distend the sock. The apparatus will thus be able to remain "locked" in the open position by virtue, on the one hand, of the alignment of the connecting rods with the lever and, on the other hand, of a small hook (13) which will hook onto the slide rods.

The opening thus formed between the two tongues, which opening is 14 cm high by 9 cm wide, makes it possible to enlarge the sock (or the support stocking) by distension and to keep it open and to ensure the passage of the foot, which will push, at the bottom of the tubular part formed by the two tongues (2 and 4), against the sock blocking the end. The passing of the heel, which was one of the technical difficulties, will be accomplished with very great ease (which would make it possible, for example, to fit support stockings in a gentle manner, and without causing any pain, to bedridden patients who have been operated on).

The detachable elongate handles (8 and 9), which are fastened on each side of the apparatus and can be adjusted in length for greater ergonomics, allow a seated user to place the apparatus at the end of his foot without needing to bend forward, thus being advantageous for elderly people, and to perfectly control the maneuver with one hand on each side of the leg. The handles make it possible to keep the apparatus at a distance and vertical, if necessary placed on the ground and resting on the two slide rods (10 and 11), so that the tip of the foot can be easily inserted between the two tongues (2 and 4). While extending his

leg, the user will pull the apparatus toward him, thereby allowing the sock (or the stocking) to slip over, become free of the tongues and be applied to the foot and the leg. By virtue of its moving lower plate (3), the apparatus will allow easy passage of the knee and may be raised as far as the thigh (in the case of a thigh stocking).

The operation of taking off the support sock (or stocking) is carried out simply with the aid of the moving part of the apparatus, that is to say the bottom plate (3) which is flanked by the two elongate handles (8 and 9) and supports, fastened perpendicularly, a tongue (4) 10 cm long by 9 cm wide in the form of a downwardly concave, small-radius cylinder portion. The user will slip this tongue between the sock and the calf until the sock comes to rest against the plate (3). The user will push the apparatus toward the ankle by means of the two lateral handles (8 and 9), which allow accurate guided movement along the axis of the leg. The sock, held by the tongue (4) at its upper orifice, will be folded over between the tongue and the leg; in a movement of bending around the heel made possible by virtue of the hollow shape of the tongue and by virtue of the length of the two handles and of the precision of the action that they allow, the sock will be removed from the foot with effortless ease (figures 4 and 5).

It is quite clear that this apparatus may also be used for ordinary socks or stockings (not support ones), where appropriate following some technical modifications.

By way of nonrestrictive example, the lever and the connecting rods could have different dimensions, as could the tongues.

Presentation of the figures of the drawing:

- figure 1/5: apparatus seen in a front three-quarters view in the closed position,
- 5       - figure 2/5: apparatus seen in a front three-quarters view in the open position,
- figure 3/5: moving part of the apparatus used for taking off the support devices,
- figure 4/5 and 5/5: schematic representation of
- 10       the process of taking off the support devices.

The technical and industrial implementation of the apparatus does not pose any particular problems. The apparatus is composed of five different parts which can

15       be produced by compression molding and injection molding (plastic, for example).

Only two assembly operations have to be performed: these are the assembly of the connecting rods (6 and 7)

20       on the lever (5) by means of a hinge pin and the assembly of the lever (5) on the fixed plate (1).

The other two assemblies (moving part (3) on fixed part (1) and elongate handles (8 and 9) on moving part (3))

25       are linked with the operating mode of the apparatus and are therefore carried out by the user.